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CLOSE OUT REPORT FOR DELETION OF
LEE'S LANE LANDFILL SITE,
LOUISVILLE, KENTUCKY

INTRODUCTION

This Close-Out Report will provide a technical justification for deletion of the Lee's Lane Landfill Superfund site, Jefferson County, Kentucky from the National Priorities List (NPL). The U.S. Environmental Protection Agency, Region IV and the Commonwealth of Kentucky Natural Resources and Environmental Protection Cabinet (KNREPC) have reviewed and evaluated the design and implementation of the actions recommended in the Enforcement Decision Document (EDD) for the Lee's Lane Landfill site and have determined that the site poses no threat to the public health and the environment. Therefore, the deletion process should be initiated. Following or concurrent with the approval of this Close-Out Report, Lee's Lane Landfill will be classified as a deletion candidate. The Close-Out Report will address site conditions, quality assurance and quality control during construction, operation and maintenance and the technical criteria for deletion.

The Close-Out Report is based on information from the following documents describing site specific conditions, design and construction activities:

- Lee's Lane Landfill Remedial Investigation and Feasibility Study Report
- Lee's Lane Landfill Endangerment Assessment
- Lee's Lane Landfill Enforcement Decision Document
- Lee's Lane Landfill Community Relations Plan
- Lee's Lane Landfill Basis of Design Report
- Lee's Lane Landfill Removal Action Report
- Lee's Lane Landfill Operation and Maintenance (O&M) Plan
- Concurrence Letter on Deletion from KNREPC
- Assurance Letter to Undertake O&M from KNREPC
- Administrative Record Bibliography
- Action Memorandum for Removal Action

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Contingency Plan (NCP), Section 300.66, I have determined that no further response action is appropriate, and that all appropriate fund-financed response under CERCLA has been implemented at the Lee's Lane Landfill Site, Louisville, Kentucky.

MAR 18 1988

/s/ Lee A. DeHihns, III
Acting Regional Administrator

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CLOSE OUT REPORT
LEE 'S LANE LANDFILL
LOUISVILLE, KENTUCKY

I. SUMMARY OF SITE CONDITIONS

Site History

The Lee's Lane Landfill site (112 acres) is located along the Ohio River in Jefferson County, Kentucky (See Figure 1). From the late 1940's to 1975 domestic, commercial, solid municipal and industrial wastes were disposed of in the landfill. Available historical records and responses to waste surveys approximated that at least 212,400 tons of mixed industrial waste (some drummed) were disposed of at the Lee's Lane Landfill by industrial firms from in and around the Louisville area. In 1975, residents were evacuated from their homes as a result of explosive levels of methane gas. Between 1975 and 1979 gas monitoring was conducted in and around the site. The results indicated that the landfill was the source of the methane and associated toxic gases. In October 1980, Jefferson County installed a gas collection system between the landfill and Riverside Gardens. In February 1980, the Kentucky Department of Hazardous Materials and Waste Management (HWM) discovered approximately 400 drums on a terrace about 100 feet from the Ohio River bank. Over 50 chemicals were identified (i.e. phenolic resins, Benzene, relatively high concentrations of Copper, Cadmium, Nickel, Lead and Chromium). The drums were removed by the owners under court order. Those drums containing hazardous wastes were transported to an approved disposal facility. In 1981, the Commonwealth of Kentucky Natural Resources and Environmental Protection Cabinet installed eleven shallow groundwater monitoring wells. The results showed high concentrations of heavy metals and Aluminum. However, the analytical report stated that many of the sample concentrations were probably elevated due to excessive sediment in the samples caused by poor well construction.

The site was proposed for the NPL in January 1982 and finalized in September 1983. The site rated an overall HRS score of 47.46, ranking it in Group 6 on the NPL. The primary factor attributing to the site being on the NPL was the detection of contaminants in the groundwater and air. Contaminants detected during gas monitoring included Vinyl Chloride, Benzene, Heptane and Methane. Surface water runoff was the other factor which attributed to the site being placed on the NPL. If contaminated surface water migrated offsite, it could flow into the Ohio River and possibly impact offsite biota.

In 1984, EPA obligated funds to NUS-FIT Corporation to conduct a Remedial Investigation/Feasibility Study (RI/FS). The draft RI/FS Reports were completed in September 1985. After the public

comment period ended and additional air data was collected, the RI/FS was finalized in April 1986.

Remedial Investigation Results

The Remedial Investigation included a sampling program for each of the potentially affected media: surface water and sediment, surface soils, groundwater, gas and air. The following sections describe the results of this investigation:

Surface Water, Soil, and Groundwater

The Remedial Investigation identified contaminants in the following media: surface water, soil, and groundwater. Onsite surface water contained very low levels of contaminants. Onsite soils and sediments were similar to the offsite background sample collected in Riverside Gardens, suggesting the use of local soils as cover material. Typical offsite soil concentration levels included Arsenic (24 mg/kg) Barium (92 mg/kg), Chromium (20 mg/kg), Lead (50 mg/kg), Manganese (1200 mg/kg) and Iron (35,000 mg/kg). In two areas where "hot spot" soil samples were collected, the estimated concentrations of Lead and Chromium were 2000 mg/kg (ppm) each. These areas were located along the access road in the central tract. They were believed to be the result of indiscriminant dumping since the concentrations found were not representative of overall soil concentrations.

Onsite groundwater contained low levels of organic compounds and some inorganic contaminants. The major inorganic contaminants included Arsenic (87 ug/l), Barium (1,000 ug/l), Cadmium (22 ug/l), Chromium (640 ug/l), Lead (150 ug/l), Manganese (44,000 ug/l) and Iron (190,000 ug/l). The offsite concentrations of these contaminants were all below the maximum contaminant levels (MCL) set in the Interim Primary Drinking Water Standards. Manganese was detected at 610 ug/l in the Louisville Gas and Electric well and at 370 ug/l in an Indiana Public Water Supply (PWS) well. Iron was detected at 8,900 ug/l in an Indiana PWS well, but was below background in both industrial wells. Neither Manganese nor Iron are considered to have significant health effects.

Gas and Air

EPA tasked IT Corporation to inspect the site for gaseous contaminants and to determine the operational efficiency of the gas collection system. The samples from the gas extraction wells contained both Methane and toxic gases demonstrating that the decomposition of land-fill wastes was still producing gases with the potential to migrate via the subsurface or air to Riverside Gardens. The results of this investigation also indicated that

the system was currently operating at less than 50 percent efficiency. Since 1980, Jefferson County has monitored the gas and the only time methane was detected in the gas observation wells in Riverside Gardens was in April and May of 1984, at which time the blower system was not operating suggests, that although the system was operating at less than optimum efficiency, it was currently controlling lateral subsurface migration.

In November 1985, the Jefferson County Department of Public Works contracted SCS Engineers to inspect the gas collection system. Repairs of problem areas noted during the inspection were begun in December 1985 by Jefferson County under the supervision of SCS Engineers.

In January 1986, EPA launched an extensive air sampling study in order to respond to odor complaints by residents in Riverside Gardens (RG). The sampling plan was developed by EPA, KNREPC, Jefferson County Department of Health and the Agency for Toxic Substances and Disease Registry (ATSDR). The objective of this plan was to determine if the RG residents were being adversely affected by Methane or toxic gases detected in the atmosphere and if the landfill was the source of these reported gaseous odors. The (January - June 1986) sampling program consisted of air/gas samples taken (1) from homes in Riverside Gardens, (2) at and around the vicinity of the landfill and (3) from the exhaust vent stack. Results of these analyses showed organics present; however, all values were low (ppb). The study concluded that the data collected did not suggest a health hazard for any potential receptors.

Public Health Assessment

During the RI/FS, EPA developed a public health assessment (PHA) for various contaminant exposure pathways at the site. The PHA concluded that the site did not pose a public health or environmental threat at this time. Immediate cleanup of the groundwater was not indicated to be necessary by the public health assessment. However, the need for long-term monitoring of groundwater and air was identified to establish baseline conditions and to serve as an early detection system should site conditions change. The public health assessment recognized that the existing gas collection system was currently preventing gas migration, but the system may need to be repaired or replaced. It was recommended that new gas monitoring wells be installed and sampled regularly. The public health assessment also noted that, due to easy public access to the landfill, the surface wastes should be removed and/or covered with clean soils.

Enforcement Decision Document Findings

The Enforcement Decision Document (EDD) signed on September 25, 1986 outlined the following selected remedial action:

- Provision for a properly operating gas collection system;
- Consideration of a possible future alternate water supply;
- Cleanup of surface waste area;
- Bank protection controls;
- Establishment of an ACL for the groundwater at the site;
- Institutional controls, such as posting cautionary signs and the installing a gate at Putman Street access point;
- Operation and Maintenance (O&M) activities that include monitoring groundwater, gas, and air and inspection of the gas monitoring wells, gas collection system, capped waste areas, and the riprap along the Ohio River bank.

Design Criteria

The EBASCO Services, Inc. REM III Team was tasked in April 1987 to perform a Remedial Design for selected actions recommended by the EDD at the Lee's Lane Landfill Site. The design criteria for the filter blanket and riprap design was based on federal and state standards and local experience. The Basis of Design Report contains a list of standards and practices deemed applicable for the site.

Riprap Design for Bank Protection

The riprap design was performed in accordance with the following criteria:

- Mean flow velocity based on the 100-year flood condition of the Ohio River at the City of Louisville, Kentucky
- Size of riprap was determined by the relationship of the mean velocity against the stone, the ratio of 50 percent stone size to the depth of flow and the unit weight of stone. The riprap sizing followed the procedure as stipulated in "Hydraulic Engineering Circular No. 11, U.S. Department of Transportation.

Stability Analysis for River Bank Slope

The conventional static Simplified Bishop slip-circle stability analysis was performed for the river bank slope stability to.

investigate its long-term and short-term performance of the slope. The soil parameter used for long term stability analysis were based on the drained shear strength of the subsoil materials. Undrained shear strength was used for the short-term stability analysis.

Construction Activities Performed

Construction activities were initiated in March 1987 at the site. These activities are described below:

Surface Waste Clean-up/Implementation of Institutional Controls (March 15-21, 1987)

Areas designated as "hot spots" in the EDD were capped with clay to prevent surface runoff. In addition a total of 296 exposed drums were buried on site. Security gates were installed at the floodwall entrance and at Putman Lane. Cautionary signs were posted at the entrance points to the site.

Construction of the Riprap Slope (May 17 - October 13, 1987)

Prior to the construction of the riprap system, data were collected from field observations and laboratory analyses. EPA, KNREPC and the U.S. Army Corps of Engineers performed a site reconnaissance of the entire river bank (northern, southern, and central tract) to determine to what extent erosion was occurring and to document areas where trash was exposed on the bank. As a result of the site reconnaissance test pit excavations were performed to secure samples to characterize waste in areas of excavation for riprap placement, provide additional definition of extent of landfill wastes adjacent to the Ohio River and secure samples of the riverbank soils for grain size analysis for design of riprap and cushion. Information gathered from the test pit data concluded that there was little, if any, landfill material in the northern tract. The landfill material was founded to be concentrated in the central tract with some encroachment on to the southern tract. Additional site investigation indicated the following:

- Landfill material was observed on the river bank in the central tract.
- The landfill material observed in the southern tract was set back from the river bank.
- The trees and vegetation in the northern and southern tract were larger and more established than in the central tract.
- The drainage feature between the southern and central tract provides a natural break between the tracts.

Based on this information, with no visual evidence of landfill material close to the river banks at the northern and southern tracts and the indication of established mature vegetation in these two regions, it was decided to limit the horizontal extent of the riprap to the boundaries of the central tract. Sampling data and results can be found in the O&M Plan for the Lees Lane Landfill site.

In June 1987, clearing operations along the central tract began. The objective of these operations were to clear the central tract (approximately 26 acres) of all brush and standing timber, and remove exposed debris and waste material. Approximately 14 acres of the riverbank was graded and sloped to a known elevation of 440 feet and lined with Class II rock for bank protection against flooding. All debris and excess timber were contained in a designated area on the southern tract. After the grading and sloping phase along the bank was completed, the area was graded covered with topsoil and seeded with a mixture of grasses.

A drainage ditch located on the western end of the site, which allows water to runoff across the central tract towards the river, was rebuilt in September 87. A new 20-inch diameter pipe was installed and the ditch lined with shale to ensure proper drainage and to prevent erosion.

The remainder of the central tract (approximately 12 acres) was leveled, covered with topsoil, sloped for proper drainage and seeded with a mixture of a grasses. Six bench marks known as monuments were surveyed to be used for reference and determination of river bank slope movement.

Monitoring Well Installation (October, 1987)

Ten gas monitoring wells and two groundwater monitoring wells were installed at or in the vicinity of the Lees Lane Landfill site and constructed to meet state and local regulations.

Gas Collection System Inspection and Repair (October - December 1987)

The gas collection system was inspected and evaluated by IT Corporation (IT). After the inspection, IT submitted a report which addressed repairs/refurbishment needed in order for the system to operate properly. After these repairs were completed, IT and Jefferson County Department of Public Works adjusted and balanced the system.

Alternate Water Supply Hook-up (November 1987)

Based on groundwater modeling conducted by EPA, it was concluded

that all private wells be abandoned within a 1500 feet zone of the site. The model indicated that if backflow periods occurred for an extended time frame, contaminants could be transported toward the Riverside Gardens subdivision. Therefore, as a precautionary measure, EPA decided to recommend that all residents using private wells within 1500 feet of the site be connected to an alternate water supply.

Field surveys confirmed that there were two operating private wells within the 1500 foot limit. These wells were connected the existing municipal water supply in the subdivision.

II. DEMONSTRATION OF QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) FROM CONSTRUCTION ACTIVITIES

EPA was responsible for ensuring that QA procedures were adhered to during construction activities. Daily logs were recorded and photos of construction activities were taken. (See OSC Report). The REM III Design Team provided an onsite field engineer during the early stages of the riverbank construction. The responsibilities of the field engineer included:

- Observing and providing engineering assistance to EPA
- Providing feedback to the in-house REM III Design Team
- Providing design information to EPA to expedite construction activities, including requirements to comply with technical specifications.
- Coordinating any modifications to the design to minimize rework by EPA.

QA/QC FOLLOWED DURING SOIL SAMPLING

All soil samples during excavation operations were collected in accordance with the Engineering Support Branch Operations Procedures and Quality Assurance Manual, April, 1986 developed by the Region IV Environmental Services Division.

The REM III Team also provided oversight during phases of inspection and repair of the gas collection system. EPA provided oversight of monitoring well installation. Monitoring wells were installed in accordance with approved specifications developed by EPA and the Contractor.

III. CONFIRMATORY SAMPLING

The EDD did not require any groundwater remediation at the site. Rather, it recommended that a ground water monitoring program be institutionalize to collect baseline data which would be used to establish Alternate Concentration Limits for the site. During the Operation and Maintenance period, groundwater will be sampled quarterly and in accordance with the Engineering Support Branch Operations Procedures and Quality Assurance Manual. The sampling program is described in detail in the O&M Plan.

Prior to clearing the central tract, soil samples were collected for grain size analysis for design of the riprap and cushion and shipped to Law Engineering for analysis. The samples were tested in accordance with ASTM D422, Particle Size Analysis of Soils. Based on the results the Remedial Design required that the sand have no more than 5 percent of the material passing the No. 200 seive. Test results are shown on data sheets and grain size distribution curves in the OSC Report.

Confirmatory testing was performed to demonstrate that the gas collection system was operating properly. After the initial inspection and repair work was completed, the system was adjusted and balanced in accordance with procedures developed by IT Corporation. Pressure readings and flow rates were determined for each of the well heads. Although it appears that some of the wells are below the established design criteria, monitoring data indicate that the system is operating properly. It should be noted that at the time of sampling the area had experienced heavy rainfall. Consequently if these wells were intercepting the water table this could account for the reduced efficiency. During the first year of O&M, EPA will monitor the system and make any repairs needed to ensure that the system continues to operate properly.

IV. SUMMARY OF OPERATION AND MAINTENANCE

Operation and Maintenance Activities

Regularly scheduled operation and maintenance (O&M) activities at the Lees Lane Landfill Site shall be performed to:

- Evaluate air quality at and in the vicinity of the landfill,
- Monitor the groundwater to establish baseline conditions and to observe any changes in groundwater conditions,
- Monitor the performance of the river bank slope protection,
- Monitor the performance of the gas collection system, and
- Observe the capped surface waste areas, document if potential problem areas exists based on these observations and correct any problems observed.

Air monitoring will be conducted quarterly for the first three years and then sampling data will be re-evaluated by EPA. The air quality monitoring program is based on the collection of volatile compounds onto a solid adsorbent with subsequent identification and quantification using gas chromatographic/mass spectroscopic techniques (GC/MS). A Combustible Gas Indicator (CGI) is proposed for detection of methane gas and a meteorological monitoring station is proposed to monitor local weather conditions.

Groundwater will be monitored on a quarterly basis for a period of three years and then EPA will re-evaluate the monitoring program. Groundwater samples will be analyzed for HSL substances. All sampling will be performed in accordance with the Engineering Support Branch Operations Procedures and Quality Assurance Manual, April, 1986 developed by the Region IV Environmental Services Division.

The operation and maintenance for the riverbank protection will consist of quarterly visual observations and surveying during the first year and thereafter, inspections and surveying will occur annually during periods of peak and minimum flow in river. Additional inspections/surveying may be necessary if severe area flooding occurs. The riprap will be sprayed for vegetation control once per year to allow for a thorough inspection.

The gas collection system will undergo a quarterly inspection and preventive maintenance program. The tasks included in the preventive maintenance program are described in detail in the O&M Plan.

The Operations and Maintenance requirements for the "hot spot" areas and other site areas where surface trash was buried/covered are minimal. Visual inspection of these areas for evidence of erosion with photographic documentation, will be made on a quarterly basis. Evidence of cover settling, ponding of water, and the condition of the vegetative cover will also be noted. Immediate steps will be taken to repair any cover settlement allowing ponding of water or erosion more than 12 inches deep. Re-establishment of vegetative cover, if required will be deferred to the appropriate seasonal time (spring and fall).

In conjunction with the capped surface waste inspections, the condition of the gate and barricade at the Lees Lane Landfill access point should also be inspected quarterly.

The KNREPC has agreed to undertake operation and maintenance activities at the Lees Lane Landfill Site. These activities will be conducted by KNREPC and Jefferson County and governed by the Operation and Maintenance Plan.

V. SATISFACTION OF DELETION TECHNICAL CRITERIA

The Deletion Technical Criteria has been satisfied by complying with requirements of the selected remedy as specified in the Enforcement Decision Document, assurances from the Commonwealth of Kentucky to conduct Operation and Maintenance, concurrence with the deletion of the Lees Lane Landfill site from the NPL by the Commonwealth of Kentucky, that no further response action is needed, and that all appropriate fund-financed response under CERCLA has been completed.